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REMARKS/ARGUMENTS

Double patenting

The Examiner has rejected claims 13 and 14 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 10 and 11 of U.S. Patent 6,334,902 (the ‘902 patent). The Examiner has also rejected claims 1, 4-6, 8-11, 12, 15 and 16 under the doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 and 7-13 of the ‘902 patent in view of U.S. Patent 5,964,952 to Kunze-Concewitz (hereafter “Kunze”). Applicants are filing a terminal disclaimer herewith to overcome these rejections. Therefore, Applicants respectfully request the rejection be withdrawn.

Claim Rejections – 35 U.S.C. § 102

The Examiner has rejected claims 1, 4, 6, 8, 9, 13 and 15 under 35 U.S.C. § 102 as being anticipated by Kunze. This rejection is respectfully traversed

Anticipation requires that the claimed invention was not new, i.e., each and every element and limitation of the claim was known or used by another or described in a patent or printed publication before it was invented by the patentee. *Hoover Group Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 299, 36 USPQ 2d 1101 (Fed. Cir. 1995). “The single reference must describe and enable the claimed invention, including all claim limitations, with sufficient clarity and detail to establish that the subject matter already existed in the prior art and that its existence was recognized by persons of ordinary skill in the field of the invention.” *Elan Pharmaceuticals v. Mayo Foundation*, No. 00-1467 (Fed. Cir. August 30, 2002) (quoting *Crown Operations*

Int'l., Ltd. v. Solutia, Inc., 289 F.3d 1367, 62 USPQ2d 1917 (Fed. Cir. 2002)); *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990).

Claim 1, as amended, recites:

A method of removing a liquid from at least one surface of at least one substrate comprising the steps of:

subjecting said substrate to a rotary movement;

supplying a liquid on at least a part of said surface of said substrate; and

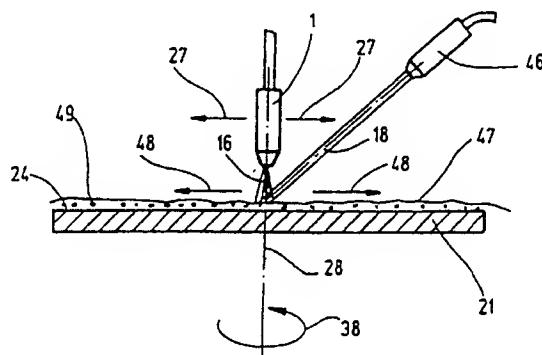
locally heating said liquid on said part of said surface at a liquid ambient front, such that a sharply defined liquid ambient boundary is created, at least locally, while subjecting said substrate to said rotary movement and supplying said liquid,

wherein **said rotary movement is performed at a speed to guide the sharply defined liquid-ambient boundary over the substrate.** (Emphasis supplied)

Contrary to the Examiner's assertions, Applicants submit that Kunze does not anticipate claim 1, as that patent does not teach or disclose locally heating a liquid such that a sharply defined liquid boundary is formed, notwithstanding the Examiner's assertion that this aspect of claim 1 is inherent in the method of Kunze.

Kunze is directed to a method of cleaning surfaces with water and steam. In rejecting claim 1, the Examiner relies on Figure 12 of Kunze and the disclosure corresponding to that figure at column 6, lines 46-61. Figure 12 and the cited text of Kunze are provided below for the Examiner's convenience.

FIG. 12



Column 6, lines 46-61 of Kunze states:

In FIG. 12, a cleaning method is shown in which the substrate 21 has water 18 sprayed on it via a water lance 46, thus creating a water film 47 on the surface 24 of the substrate 21. Via the water lance 46, the water 18 is fed onto the surface 24 at the center 28, so that the water 18 runs off in the direction of the arrows 48 in the form of a water film 47. At the same time, the spray nozzle 1 sweeps over the surface 24 in the direction of the arrow 27 and sprays steam 16 directly into the water film 47. Vapor bubbles thus form in the water film 47, which either immediately collapse again or burst at the surface of the water film 47. Along with the pulsing action of the water vapor 16, the particles 49 also undergo the impulsive action of these vapor bubbles, and are loosened or detached in this way from the surface 24. They are then carried away along with the outflowing water film 47. (Emphasis supplied)

As may be seen from the foregoing portion of Kunze (which is the entirety of the disclosure corresponding with Figure 12) Kunze teaches that “steam is sprayed directly into the water film.” As a result of spraying steam into the water film [v]apor bubbles are formed in the film, “which either immediately collapse again or burst at the surface of the water film.”

Applicants submit that, based on the foregoing, Kunze does not teach creating a sharply defined liquid boundary. In fact, Kunze teaches agitation of the water film with the steam, such than vapor bubbles are injected into the film. These vapor bubbles create a “pulsating action” in the water film, such that “particles [on the surface or a substrate] undergo the impulsive action of these vapor bubbles.” Applicants submit that Figure 12, and the corresponding description, teach an agitation process that will result in a dynamic and undefined liquid-ambient boundary, not in a sharply defined liquid ambient boundary, as recited in claim 1.

In contrast to Kunze, the application describes one approach that may be used to create such a sharply defined liquid-ambient boundary on page 8, on lines 13-15, which states that by “locally heating [the] substrate while supplying [a] liquid” a sharply defined liquid-ambient boundary is at least locally created by a reduction in the surface tension of the liquid. Comparing

this portion of the application with the method disclosed in Kunze demonstrates that Kunze cannot anticipate claim 1 and the rejection should be withdrawn.

Claims 4, 6, 8 and 9, as amended, depend from claim 1. Therefore, these claims are patentable over Kunze on the same basis as claim 1. Thus, the rejection of claims 4, 6, 8 and 9 should be withdrawn.

Claim 13, as amended, is directed to an apparatus for removing a liquid from a surface of a substrate. Claim 13 specifically recites:

An apparatus for removing a liquid from at least one surface of at least one substrate, said apparatus comprising:

a substrate holder which is subjectable to a rotary movement, said substrate being releasably held by said substrate holder;

at least one liquid supply system for applying a liquid on at least a part of said surface of said substrate;

at least one heat source for locally heating said liquid; and

said heat source and said liquid supply system being positioned such that said heating is applied closer to the center of said rotary movement of said substrate holder than said liquid and wherein **said heat source and said liquid are positioned such that, at least locally, a sharply defined liquid-ambient boundary is created on said surface of said substrate.** (Emphasis supplied)

While not limiting in scope to claim 1, the apparatus of claim 13 may be used to implement embodiments of methods in accordance with claim 1. In this regard, claim 13 recites that a heat source and a liquid (being removed) are positioned in the apparatus "such that, at least locally, **a sharply defined liquid-ambient boundary** is created on [the] surface of [the] substrate." As was discussed above with respect to claim 1, the apparatus of Kunze operates so as to agitate a liquid on a surface of a substrate by injecting steam into the liquid to impinge on particles and/or contaminants. The apparatus of Kunze does not position the liquid and a heat source such that a sharply defined liquid-ambient boundary is created. Therefore, Kunze cannot anticipate claim 13, and the rejection should be withdrawn.

Claim 15, as amended, depends from claim 1. Therefore, that claim is patentable over Kunze on the same basis as claim 1. Thus, the rejection of claim 15 should be withdrawn.

Claim Rejections – 35 U.S.C. § 103

Rejection on Kunze in view of Leenaars

The Examiner has rejected claims 5, 10, 11 and 14 under 35 U.S.C. § 103(a) as being unpatentable (obvious) over Kunze in view of U.S. Paten 5,271,774 to Leenaars et al. (hereafter “Leenaars”). This rejection is respectfully traversed.

It is well settled that in order to establish a *prima facie* case of obviousness, the Examiner must demonstrate that there is some suggestion, teaching or motivation in the prior art to produce the claimed invention. See *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991); MPEP § 2143. Applicants respectfully assert that the combination proposed by Examiner fails to establish a *prima facie* case of obviousness and, therefore, does not render claims 5, 10, 11 and 14, as amended, obvious.

Claim 5 depends ultimately from claim 1 and includes all the limitations of that claim and intervening claim 4. Claim 5 recites a method where the rotation speed of the substrate is in the range of 2 to 40 revolutions per second. Leenaars is directed to a method for removing of a liquid in a centrifuge chamber. Leenaars, in column 5, line 34, discusses rotation speeds of 5, 8, 17 and 50 revolutions per second, which are applied in the centrifuge chamber.

Without addressing the Examiner’s assertions with respect to Leenaars regarding the prevention of back splashing and the use of particular solutions, which are not herein conceded, Applicants note that Leenaars does not describe local heating to create a sharply defined liquid-ambient boundary, as is described in claim 1. Therefore, the combination of Kunze and

Leenaars, assuming that combination is proper, produces a method where a liquid film on a substrate is agitated with injected steam while the substrate is rotated in a centrifuge between 5 and 50 revolutions per second. This combination does not teach, suggest or motivate a method where local heating applied to create a sharply defined liquid boundary, such as recited in claim 1. In view of the foregoing, claim 1 is not obvious, and therefore claim 5 is also not obvious, over Kunze in view of Leenaars. Therefore, the rejection should be withdrawn.

Claims 10 and 11 also depend ultimately from claim 1 and therefore are not obvious over the combination of Kunze and Leenaars for the same reasons as were discussed above with respect to claim 5. Therefore, the rejection of claims 10 and 11 should be withdrawn.

Claim 14 depends from claim 13. As was discussed above, claim 13 is directed to an apparatus for removing a liquid from a surface of a substrate where a heat source and a liquid are positioned such that, at least locally, a sharply defined liquid-ambient boundary is created on a surface of the substrate. Because the combination of Kunze and Leenaars would produce an apparatus that agitates a liquid on a surface of substrate located in a centrifuge chamber, that combination does not render claims 13 or 14 obvious. Therefore, the rejection of claim 14 should be withdrawn.

Rejection on Kunze

The Examiner has also rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Kunze. The rejection is now addressed.

Claim 12, recites:

**A method of removing a liquid from a first surface and a second surface of at least one substrate comprising the steps of:
subjecting said substrate to a rotary movement;**

supplying a liquid on at least a part of said first side and at least a part of said second side of said substrate; and

locally heating said liquid on said part of said first surface and on said part of said second surface while supplying said liquid, such that the surface tension of said liquid is locally reduced due to a surface tension gradient being formed in the liquid, the gradient being in a direction away from a sharply defined liquid-ambient boundary that is created, at least locally, during the steps of subjecting said substrate to a rotary movement, locally heating and supplying said liquid, and

wherein said rotary movement is performed at a speed to guide the sharply defined liquid-ambient boundary over the substrate.

The Examiner asserts that it would be obvious to use the Kunze on two sides of a substrate. Notwithstanding the Examiner's assertion, which is not conceded, Kunze still fails to teach suggest or motivate locally heating a liquid on the substrate such that a surface tension reduction gradient and a sharply defined liquid-ambient boundary is created, as recited in claim

12. Therefore, claim 12 is not obvious over Kunze, and the rejection should be withdrawn.

Rejection on Kunze in view of Hamada

The Examiner has also rejected claim 16 on Kunze in view of U.S. Patent 6,106,636 to Hamada et al. (hereafter "Hamada"). This rejection is now addressed.

Claim 16 depends ultimately from claim 13 and includes all the limitations of that claim and intervening claim 15. Claim 16 is directed to an apparatus as described in claim 13 where nozzles for dispensing a quick and, for example, a heated gas are mounted on an arm that is movable with respect to a substrate holder. Hamada is directed to a washing apparatus with a movable arm.

Notwithstanding the Examiner's assertion that it would be obvious to combine the teachings of Hamada with Kunze, which is not herein conceded, Applicants note that Hamada also does not describe an apparatus where local heating is used to create a sharply defined liquid-ambient boundary, as is described in claim 13. In this regard, the combination of Kunze and

Hamada, assuming that combination is proper, produces an apparatus in which a liquid film on a substrate is agitated with injected steam dispensed from a nozzle mounted on a movable arm. This combination still fails to teach, suggest or motivate an apparatus which applies local heating to create a sharply defined liquid boundary, as has been previously discussed. In view of the foregoing, claim 13 is not obvious over Kunze in view of Hamada. Therefore, claim 16 is also not obvious over Kunze in view of Hamada and, the rejection should be withdrawn.

Conclusion

In view of the foregoing, it is respectfully asserted that all of the claims pending in this patent application are in condition for allowance. If the Examiner has any questions, he is invited to contact the undersigned at (360) 379-6514. Reconsideration of this patent application and early allowance of all the claims is respectfully requested.

Respectfully Submitted,

McDonnell Boehnen Hulbert & Berghoff

Date: Aug 25, 2003

By:


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Reg. No. 47,495

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

The undersigned hereby certifies that the foregoing RESPONSE TO OFFICE ACTION MAILED ON APRIL 24, 2003 is being deposited as first class mail, postage prepaid, in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 25th day of August 2003.


Paul W. Churilla